

Thread:Use of Convergent Mobile Technologies for Sustainable Economic Transformation in the lives of Small Farmers in Rural India (1)

INTRODUCTION

The Indian agricultural scenario turned bad to worse in the last one decade. The number of suicides of small- scale farmers and marginal- scale farmers has been steadily rising over years, constantly hovering around 4000- 5000 a year in certain States like Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu. Nearly 29,000 farmers committed suicide in Maharashtra between 1997- 2005, according to official sources.(Sainath,P: 2007).

According to Sainath (a world renowned journalist, Raman Meghasasay Award winner for 2007 and currently Editor for the Rural Affairs in The Hindu News daily published from Chennai, India), out of 150,000 farmers who killed themselves across the country during the period 1997- 2005, almost every fifth one was from Vidharbha, the eastern region of Maharashtra State of India. "It is 105 per cent increase in farm suicides in those nine years. More than 19,000 of those farmer suicides occurred from 2001 onwards', added Sainath.

Table I

Fig I

The data in the tables I and II, and Fig 1, are based on the analysis done on farm suicides by K. Nagaraj of the Madras Institute of Development Studies (MIDS). Professor Nagaraj has carried out the above analysis using the data with the National Crime Records Bureau (NCRB), and Ministry of Home Affairs, from 1997 to 2005. Since, Maharashtra State reported the data officially

during 1995 and 1996 also, the cut of date as 1997, from which year on all the states began their regular reporting of deaths, formed an ideal base statistically. Taking into consideration these two years too, the number of farmer suicides during the 1995- 2005 period was almost 32,000. It means an increase of over 260 per cent between those years. (Maharashtra is one of the country's richest States. Its capital, Mumbai, is home to 25,000 of India's 100,000 dollar millionaires).

'Professor Nagaraj's study shows that of the almost 150,000 farm suicides in India between 1997 and 2005, over 89,000 occurred in just four States: Maharashtra, Andhra Pradesh, Karnataka, and Madhya Pradesh (including Chhattisgarh)', says Sainath (2007:p 13).

Importantly, Maharashtra accounts for a third of all farm suicides within these Big Four States. "This State," says Professor Nagaraj, "could be called "the graveyard yard of the farmers" In terms of percentage, Andhra Pradesh saw more than 127 per cent of farmer suicides during the same period.

The above data show that there existed a high annual compound growth rate of suicides both for Andhra Pradesh (7.6%) and Maharashtra (13.7%). It also indicates that if current conditions continue to prevail next six years, these percentages might double.

Important causes- diagnosed

Four important reasons could be diagnosed for such high percentage of suicides. i. Debt -trap ii. Crop failure iii. Lack of support price from the Government, and iv. Government's

apathy towards agricultural sector (Sainath, 2007).

As a result of these four major causes, many side effects flowed in. Due to distress, the health of the farmers and their families got affected while no medical relief worth its name available at the hinterland of India even now. Secondly due to financial distress, doubled by the lack of proper support price to whatever farmers could produce, farmers couldn't discharge their family responsibilities like performing the marriages of their daughters and sons, etc. All this added up to the frustration resulting in a mass hysteria of committing suicides as panacea for all humanly problems. Such suicides had driven the farmers' families to far more depravation and abject poverty at once which led to massive migrations from their villages to urban centers to work as construction workers which might earn them a dollar or two dollar a day. The children of these farmers' families overnight turned into child-laborers throwing their education to winds at once. According to National Sample Survey's situational report on farmer households, the average expenditure of farm households is rupees 17 a month (less than half the exchange value of a dollar in Indian currency. A USD is equal to nearly 39 rupees currently). The wages of the agricultural laborer had not gone up beyond a US dollar (rupees 39- 40) in a decade which led to a situation where India had fallen from the 124th to 128th position in the world human development index in the last 15 years ([http:// en.wikipedia.org/ wiki/ List_of_countries_by_Human_Development_Index](http://en.wikipedia.org/wiki/List_of_countries_by_Human_Development_Index)).

According to Sainath (2008), in the post globalization, about 82% farm households landed in the debt trap. The state is withdrawing from its investment into agriculture, which was earlier 14.5 per cent of the Gross Domestic Product (GDP) to 5.9% in the recent years. As a result the farming sector's contribution to nation's real GDP has gone down from an estimated 3.6 % to 1.5% which result had even horrified the Government presently headed by a noted economist and the Prime Minister Manmohan Singh. Commenting on the declining GDP from the agricultural sector, Chandrasekhar (2004) wrote that, 'after a span of relative stagnation during the previous two decades, agriculture witnessed an improved growth of 3.2 per cent in the 1980s; but the growth performance was somewhat subdued in the 1990s, and especially in the last 10 years, with the real GDP originating from agriculture growing at a modest 2.9 per cent. This was the result of near- stagnation in crop yields, falling public investment in agriculture, adverse impact of low world prices following gradual integration with global markets'. Recently, the UNDP representative to India, Maxine Olson, (2007) releasing the UNDP Report on Climate Change, warned India that, "terms of trade and changing rainfall patterns on account of climate change could result in drops in agricultural productivity, directly affecting 60 per cent of the population, which relied on the farm sector".

Lack of support price for the farmers' produce for major crops like rice or paddy, wheat, sugar cane, cotton, corms, Red chilies, Oils, etc is another issue of concern and a major force for committing the suicides. The following report (in the inbox) brings out live the force behind such suicides more vividly than ever. At farmers' meet, agricultural panel chief shoots from hip Amrita Chaudhry Posted online: Monday, November 19, 2007 at 0000 hrs IST Ludhiana, November 18

Hands folded, tears wetting his cheeks, Saroop Singh, a 52- year- old farmer, begged for deliverance. "Save me or I will be forced to commit suicide." The farmer spoke not just for himself but for the 60- odd farmers gathered to meet Dr T Haque, chairman of Commission for Agricultural Costs and Prices (CACP), at the office of the District Chief Agriculture

Officer here on Sunday evening. "The price we get for our crop is too little to sustain us," Saroop went on, telling Haque about his three- and- a- half acres and a loan of Rs 1.5 lakh that he had been unable to repay for the last three years. "Another difficult year and I will have no option but to commit suicide," he sat down, only to spring up again to add: "I am glad I took this loan from a bank, had it been from an arhtiya I would have been dead by now."

Haque, with a frowning look, snapped: "Don't commit suicide, no one will bother. Pick up the gun, or protest in any manner you know." There was complete silence in the room as he went on: "The Vidharbha experiment has failed, we have had more farmer suicides after the PM relief package than before it." Haque told the farmers how the price they sought and the price that economists and universities recommended was hundreds of rupees apart. "No one seems to be hearing your voice." (Indian Express: [http:// www.indianexpress.com/printerFriendly/ 240746.html](http://www.indianexpress.com/printerFriendly/240746.html))

Government's flawed approach to agricultural sector

Further. Government's apathy, both at the center and at the States, towards the agricultural sector left the entire farming community in the lurch and perennial depravation. The United Progressive Alliance (UPA) which came into power in 2004 did nothing to improve the plight of the farmers in the first two years. Neither they examined the causes in depth for the mounting number of suicides by each passing day (approximately 2- 5 each day) nor did they take up measures for the alleviation of the agrarian crisis in India. However, two years later in 2006 (July) Manmohan Singh government announced a package -Vidarbha package- - for the farmers who committed suicide in Vidarbha, Andhra Pradesh and Karnataka. ([http:// pmindia.nic.in/press_rel_01jul2k6- 1.pdf](http://pmindia.nic.in/press_rel_01jul2k6-1.pdf)) It was first ever attempt by any government to address the problems of the farmers at national level. However, a major part of the relief package had gone to Vidarbha with a minimum being shared by the rest of the States like Andhra Pradesh and Karnataka, besides Tamil Nadu. Nevertheless, the Government's bureaucratic definitions of suicides and the causes of suicides for granting relief under the package played foul with the ground realities (see Table I and II). Even restructuring of loans and the waiver benefit of the loans for the small and marginal farmers, who could not pay back, did not meet the realistic situation at the field level (see Table III). . Keeping the ensuing elections to Parliament in mind, the UPA government in the face of mounting pressure from the rival political groups such as Marxists and United National Progressive Alliance (UNPA) again announced during the current budget session this year a waiver package of bank related loans to the affected farmers to the tune of 600 billion rupees. However, like in the case of earlier Vidarbha package, there is a mismatch again between the government's operational definitions of the affected farmers and the realities in which Indian farmers keep thriving themselves.

Further, the government has not yet implemented the Swaminathan (a noted agricultural scientist and formerly Director of International Rice Research Institute, Philippines, Manila) Committee's Report on Minimum Support Prices (2006). The perennial grievance of the farmers over years is that they are not getting minimum support price from the government itself. The vicious nexus between the middlemen and the politicians poses an insurmountable barrier to address this issue which is leading to low remunerative prices for the farmers and spiraling of prices for the common man. In the process, the middlemen are making bounty of gains by sheer exploitation of farmers Table III Important Causes and

Effects of Agrarian Crisis and matching Mobile technologies

S.No. Diagnosed Causes Effects Technologies Gains/ outcomes

1. Debt trap Private loans at high interests; lack of support from nationalized banks or private banks; lack of information about the various ways to obtain the bank loans and availing government packages Mobile phones with sms and internet facilities; cable or satellite tv channels, radio, computer literacy or mobile literacy; cyber cafes Knowledge of various personal finance schemes available through banks, awareness of the consequences of private loans, knowledge of documentation for obtaining loans through banks
2. Crop failures
 - i. Shortage of quality seed supply
 - ii. Fake seed supply
 - iii. Fake fertilizers and manures
 - iv. Over use of pesticides
 - v. Short term crops
 - vi. Gainful commercial crops

In addition to above, e- mailing and e- chatting, e- conferencing will bring in community inter- exchange of information elsewhere.

Knowledge of information about the water availability through canals, knowledge of climatic changes like floods, cyclones, alternating commercial crops with rice or wheat Choosing market oriented crops such as bio- diesel, palm oil. Cereals, corms etc. 3. Support Prices

- i. Failure of government
- ii. Middlemen nexus with politicians

Lack of proper calculation on the crop yield and price gain. Lack of knowledge of other markets and profit making crops. - - - - do - - - - Prior accounting and planning

4. E- marketing/ E- bay/ Ecommerce

Lack of knowledge to avoid middlemen - - - do - - Self supporting e- marketing at the market yards through the formation of cartels and syndicates. The knowledge of e- marketing and e- commerce is still elusive to the small Indian farmers and short term vegetable growers (Murthy, 2008a). Due to lack of minimum support price as recommended by the Swaminathan Committee (2006) and due to the vicious nexus between the middlemen and politicians, the farmers in Indian are caught in a quagmire without a way out from the stress of perennial and recurrent losses. The World Congress on Communication for Development (held at Italy between Oct 25- 27, 2006) identified 13 important projects which can be executed with distinct development communication approaches and means within the organization working at distinct societal and geographic levels. Some of these are: Extension/ Diffusion of innovations as a Development Communications Approach, Network Development and documentation, ICTs for Development, Social Marketing, and Edutainment (EE) Health Communication. Social Mobilization, Information, Education and Communication (IEC), etc. (2006: p7). It had discussed the role of communication in the development against three basic themes: a. Communication for Sustainable Development b. Communication for Development of Health and c. Communication for development of Governance.

While dealing with “How to reduce India’s rural distress”, Daniel J Gustafson, Representative of India for Food and Agricultural Organization, wrote that, ‘....The third emerging area is promotion of experience and knowledge sharing particularly by those who historically have not participated in UN- sponsored forums. An example is the UN’s Solution Exchange initiative that connects for problem solving through e- mail groups and periodic meetings. Another example is the interaction between farmer groups in India and Kenya. Each side has complementary strengths and experience in micro- credit and in taking on agricultural improvement through group learning experiences. Putting them together opens up technical cooperation in an exciting new way. This approach also applies to work by NGOs on dry land agriculture in the Deccan Plateau and a new South Asian partnership

with National Dairy Development Board for pro- poor livestock development” (Daniel J Gustafson: 2006).

As such the World Congress on Communication for Development recommended i. a free, independent, pluralistic and responsible media system through which open dialogue and debate can occur, ii. Broad public access to a variety of communication media and channels, as well as a regulatory environment that promotes pro- poor licensing for local radio and low cost universal access to internet and telephone services. (2006).

The present study, aims at exploring some alternative designs and strategies at low cost through convergent mobile technologies that go a long way in supporting the farmers to address some of their problems—crop failures, debt traps, efficient planning and marketing, etc. The present paper thus aligns itself with the participatory model (Freire, P: 1983, Mefalopulos P, 2005) which otherwise broadens the diffusion model (Rogers, E.M, 1962, 1976) and encompasses all the four laterals of the Communication for development such as i. the use of culturalist view point, ii the use of an interpretative perspective, iii. the use of integrated theories and methods, and iv. to show mutual understanding and attach importance to formal and informal intercultural teaching, training and research.

DEFINITIONS OF MAIN TERMS IN THE DISCOURSE: MEDIA, CONVERGENCE AND MOBILE TECHNOLOGIES

In the present paper, the term, ‘media’ extends beyond the meaning of ‘traditional media’ (like print media or electronic media like Radio and TV). In fact today the term ‘media’ became extensive and pervasive in its connotation with new media or alternate media emerging as main competitors to the traditional media (Flew, T: 2002). Here in this paper the term ‘media’ covers even telecommunications including satellite technology which is the bottom line of support for all new media such as internet (e- learning) and cable television, teleconferencing and videoconferencing (Murthy 2008a). The reason for taking such a wider canvas for the term ‘media’ is the constant observation of many media experts on the well documented failure of the ‘mainstream journalism’ in addressing the problems of rural India. The problems of rural India are of not much commercial value for the mainstream press or electronic media. The development journalism in India, on the other, is a non- starter. (Murthy CSHN, 2008 b).

The term ‘convergence’ defined as the one ‘technologically coming together of two or more distinct entities or phenomena’. Convergence is increasingly prevalent in the IT world; in this context the term refers to the combination of two or more different technologies in a single device. Taking pictures with a cell phone and surfing the Web on a television are two of the most common examples of this trend. Convergence may influence consumers to accept new technologies.([http:// whatis.techtarget.com/ definition/ 0,,sid9_gci211837,00.html](http://whatis.techtarget.com/definition/0,,sid9_gci211837,00.html)).

Computer- television convergence is already underway with WebTV, which pipes the World Wide Web to a slightly- modified TV set with a set- top box from an ordinary phone line and provides a degree of interactivity.([http:// whatis.techtarget.com/ definition/ 0,,sid9_gci211837,00.html](http://whatis.techtarget.com/definition/0,,sid9_gci211837,00.html)) New media rely on digital technologies, allowing for previously separate media to converge. Media convergence is defined as a phenomenon of new media and this can be explained as a digital media. “The idea of ‘new media’ captures both the development of unique forms of digital media, and the remaking of more traditional media forms to adopt and adapt to the new media technologies.” Convergence captures development futures from old media to new media. For example, we can easily see that

people watch movies in the home on DVD these days instead of videocassettes (http://en.wikipedia.org/wiki/New_media). Similar examples are MP3 Player and a Digi- cam combined in a cell phone. The most prominent example of media convergence is the Internet, whereby the technology for video and audio streaming is rapidly evolving. The term convergence is disputed, with critics such as Lev Manovich (2001) pointing out that the 'old' medium of 'film' could be seen as the convergence of written text (titles and credits), photography, animation and audio recording.

Mobile technologies are satellite and cable based. Cell phones and internet connected telecommunications fall under mobile technologies.

TWIN TECHNOLOGICAL DEVELOPMENTS—A PREREQUISITE

In order for achieving the sustainable economic transformation in rural India a combination of telecommunications (including satellite services) with electrification of Indian villages (with appropriate power supply) is an important pre- requisite (MSERVE INDIA, Aug 1- 2, 2007)

Complete Rural Electrification by 2012

As of now India is still a power deficit country. Recently Government of India (<http://www.i4donline.net/nov07/content.asp>) under 11th plan, tried to push forward the electrification of rural India under Rajiv Gandhi Grammeena Vidutikaran Yojana (RGGVY). The plan envisaged complete rural electrification of India by 2012 in order to provide power on demand in any village of India. However, out of the 120,000 villages so far 40,000 villages were provided with the power. Under the new scheme habitations with a population of 100 even would be provided with the power. (Sujay M, 2008) Earlier this limit was 300 people per hamlet. It is also mandated that all such villages which are brought under RGGVY scheme would be provided an uninterrupted power supply for minimum 6- 8 hours a day. Further free connection would be provided for the families under the Below Poverty Line (BPL) with an income limit of Rs 2,200/ - per month (apply 50USD). The earlier limit was Rs. 1,500 (35- 40 USD apply). If the Government of India could go in for the Nuclear Deal which is hanging fire due to the hurdles posed by the Leftist groups of the United Progressive Alliance (UPA) the realization of above target is not impossible. However, even if the nuclear deal does not get through the possibility of country achieving this cannot be ruled out at the current economic growth with 8.5 to 9 GDP each quarter, averaging to 7.5 to 8 GDP annually. (<http://www.thehindu.com/2008/02/13/stories/2008021355021500.htm>). .

Widening internet and telecommunications

According to a latest report published in Times of India (Oct 22, 2007), 'the Internet usage in India has grown more than 11 times over the last seven years. The boom is being driven not by metros, but by smaller and non- metro towns, where the number of users has risen by a whopping 69 times and 33 times respectively since 2000'. The report further says that the number of users has grown in all socio- economic categories, as well as in all metros and non- metro towns.

Table IV Users in 2000 2007 Growth % Top Metros 10.78 58.52 543 Smaller Metros 1.82 32.34 1777 Non- Metro Towns 0.56 18.48 3300 Small Towns 0.7 44.66 6380 Total Users 14 154 1100 Users in hundred thousands • Metros: Population 4 million above • Smaller Metro: Population one million to 4 million • Non- metros: Half million to one million • Small Towns: Half million below

Courtesy: Times of India. Oct 22, 2007

The report further added that the number of users has grown in all social categories in all metros and non-metros. Though the 8 metros still stand out highest in figures, the growth has been the fastest in the smaller and non-metro towns. According to the report the small towns have the second largest number of total users. The findings published in the Times of India are the results of the survey conducted by e-technology group of IMRB International. The I-cube 2007 survey conducted across 30 cities and towns covering 35,000 people. The IMRB survey noted that the highest number of people use net for e-mail and information search. More than 7.5 million people in India use the e-mail as their basic mode of communication (Rangaswami, N; 2007).

The above study has taken into consideration of internet users through cybercafés only. However, the boom in telecommunications coupled with mobile phones based on satellite communication network today has made it possible to access internet, e-mail and chat or conferencing right on one's mobile or personal computer cum television.

In fact, as one can read into the analysis of suicidal cases being recorded by the Government, there are many suicides which fall into the category other than debt traps. Crop related failures, remunerative prices and financial inputs (such as loans—both long term and short term) are the ones which the information technologies could efficiently address. In this context mobile technologies could be very handy at the rural level.

According to a study of Keval J Kumar and Amos O Thomas (2006), mobile telephone services have become so cheap now that mobile subscriptions have outpaced fixed line connections; in 2005 and 2006. On an average 4.5 million new mobile subscribers were added every month. The rapid spurt in tele-density has been exceeded only by China. Cellular communication technology is the fastest growing one in the continent of Africa.

Unique features of Mobile Phones

Its light weight, portability, user-friendly and fairly inexpensive features would make it accessible to every category of society, rich and poor alike. It combines the characteristics of the traditional and the new media. It can comprise traditional media such as recorded music, photography, cinema, radio, television and the press and uses the new media to extend its storage, processing and distribution capacities (as quoted by Van Dyke, 2005 in Kumar and Thomas, 2006). According to Kumar and Thomas, 'the boundary between the cellular phone as a medium of interpersonal communication and as a mass medium for the distribution of Short Message Service (SMS), web pages, videos and games is dissolving'. Mobile telephony is gradually merging with mobile computing. In fact mobile telephony has the power of empowering individuals and groups; it is interpersonal, immediate and extremely convenient. It has the potential to contribute to the new public sphere. (Kumar and Thomas 2006).

Use of Mobile Technologies for Sustainable Economic Transformation in the lives of rural farmers

Use of mobile technologies for the empowerment of deprived social groups is not something new phenomenon. Recently the IIT Bombay had developed a farmer friendly software where registered farmers can have their queries answered on a mobile phone without having to go to a kiosk or cyber-café. Earlier, the IIT Bombay developed a multilingual portal called AQUA (All Questions Answered). Farmers can now ask questions on crops or livestock in SMS either in Marathi or Hindi or English. They can also seek information in advance and access it later in the offline mode. As a pilot project, the IIT Bombay has also

installed three dozen weather -cum- disease forecasting stations in and around Nashik and farmers are alerted via SMS about a probable crop diseases or rainfall likely to hit the crops with the implications and possible precautions. (Mihika B, 2007)

Mauren and Da Silva (2007) developed a pedagogical design for digital inclusion in the rural areas for farmers and the construction network of cognitive development and social capital (Learning Projects of Lea Fagundes). Galit and Michal (2007) carried out a pilot case study which aims to examine how socio- cultural and situated learning aspects are reflected in learning experiences within a novel mobile learning environment, Math4Mobile, a cellular application for mathematics learning. The study obviously laid foundation for imparting basic mathematical skills to the illiterate farmers of rural areas through mobile technology. In another study Renee et al studied the social and political challenges related to the implementation of ICT- Kiosk projects for rural development in India. In fact, the widening of telephone net work and lowering of telephone rates way back in 1999- 2004 during the National Democratic Alliance (NDA) governance itself revolutionized the rural economy. Many unemployed youth, physically challenged and senior citizens got telephone connections in the rural India under self- employment schemes. In another study of far reaching consequences, Paul and Tapan (2007) showed that use of mobile technologies and information systems on the rural front reduced the inefficiency and enhanced the supply chains. Indrani et al (2007) offered a design that would enable even illiterate farmers and rural artisans, besides vocational groups, to use the interface which is a text free one. Reuben (2007) conclusively showed how mobile phones and economic development are interlinked in one of the most important industries—fishing industry—in India. Hengyuan et al (2007) proved that though innovations stem from the developed world, they are fast embraced in developing countries. Sudip Aryal (2007) developed a comprehensive pilot project for rural transformation of Nepal by establishing community information centers.

Types of Mobile Services available in India

The two types of Mobiles—both Groupe special Mobil (GSM) and Code Division Multiple Access system (CDMA) -are available in India. Where as Nokia garners about 40% of total mobile sector consumption in GSM mobile technology, it too offers a mobile phone with SMS and phone book, chat, conferencing, calculator facilities, etc at a cost of 25 USD. Nokia offers mobiles with radio, MP 3 player and camera at the price of 100 USD with color screen also. Most of the competitors to Nokia are Samsung and Sony Erickson which however offer products at a slightly higher price than Nokia with similar technological features.

In CDMA category, TATA Telecom and Reliance Telecom offer localized mobile handsets with roaming facility entire country. They are much cheaper than the GSM version of Noakia, Samsung and Erickson. All these mobiles are having single sim card facility only and the mobile number has restricted use in terms of tariff and roaming services.

Of late mobiles with GSM and CDMA with twin sim cards are also coming up quite handy with multimedia in puts such as internet, radio, television, scanner and camera too. Yet, they are not very costly (150- 200 USD). There are many cellular services like IDEA, AIRTEL, BSNL, VODAFONE etc which are offering very low packages as low as free life long incoming call facility. They are also offering the services at costs as low as 10- 1000 and above also. There are top up and recharge facilities.

CONCLUSIONS

In spite of rapid advancement in technology and a spectrum of satellite services coupled with booking economy, Indian farmers and weavers are committing suicides due to lack of a concerted approach to the agrarian crisis the country is facing. Firstly there is an immediate need to address the financial indebtedness of the small farmers and marginal farmers on realistic terms quite free from the jargon of complicated bureaucracy mind set. The financial help in the form of waiver of loans should be broad based and liberal towards small farmers with human face. To avoid recurrence of farming sector landing into crisis, an appropriate technological approach coupled with infrastructural facilities is the need of hour. The available convergent mobile technologies as described above would go a long way in alleviating the distress of the Indian farmers and help them compete with the global markets.

REFERENCES

- Abraham R (2006) Mobile Phones and Economic Development: Evidence from the Fishing industry in India. Paper Presented at IEEE Xplore Conference May
- Chandrasekhar G (2004) Agriculture: Sowing the Seeds of Strength The Hindu. January 28. <http://www.thehindubusinessline.com/b110/stories/2008020659191300htm>
- Chaudhry, A (2007) At farmers' meet, agricultural panel chief shoots from the hip. Indian Express Page 2. November 20. <http://www.indianexpress.com/printerFriendly/240746.html>
- Daniel J Gustafson, (2006) How to reduce India's rural distress. Deccan Chronicle in "Meanwhile" Column Oct 31. (Karimnagar Edition).
- Flew, Terry (2002) New Media: an Introduction, Oxford University Press, South Melbourne, pg.11
- Friere P (1983) Pedagogy of the oppressed, Seaburg Press, New York.
- Galitz B and Michal Y (2007): Mobile Application for Mobile Learning. Paper presented at IADIS Conference, Algrave, Portugal, 7- 9 Dec.
- Hengyuan Z, Ligang Y and Guisheng W (2006). How the Telecommunication Market in Developing countries that in Developed countries. Paper Presented at IEEE Xplore Conference May
- Indrani M , Sagar A and Toyama K (2006). Text Free User Interface for Illiterate and Semi-literate User . Paper Presented at IEEE Xplore Conference May
- Keval JK and Thomas AO (2006). Telecommunications and Development: The Cellular Mobile "Revolution" in India and China. Journal of Creative Communications, 1, 297.
- Manovich, Lev (2001). "The Language of New Media". MIT Press, Cambridge, Massachusetts. pg. 20
- Mauren P and Moreira Da Silva (2007). Taking of Conscience of the Digital inclusion as promotional of social and Cognitive Development in the Rural Area Paper presented at IADIS Conference, Algrave, Portugal, 7- 9 Dec.
- Maxine Olson (2007) UNDP: help the poor cope with climate change risks. The Hindu Nov 28 as reported by P.Sunderarajan. <http://www.thehindu.com/2007/11/28/stories/2007112861951700htm>
- Mefalopulos P, (2005) "Communication for Sustainable Development: Applications and Challenges" in Hemer O and Tufter, T (Eds). Media, Communication and Social Change: Rethinking Communication for Development. Buenos Aires: CLASCO and Nordicom.
- Mihika B, (2007). Crop Problems? Farmers can text IIT Bombay for answers. Indian Express. December 10. <http://www.indianexpress.com/story/248582.html>

Mobile Technologies for development (2007). i4d, Nov 2007. <http://www.i4donline.net/nov07/content.asp>

Murthy C.S.H.N. (2008a) Designing E- Learning Programs for Rural Social Transformation and Poverty Reduction Turkish On line journal of Distance Education January. Article No.11.

Murthy C.S.H.N.(2008b) Issues of Rural Development in Mainstream Journalism: An Analysis Digital Divide. Paper presented at National Seminar on Media and Rural Development - Challenges and Opportunities at Punjab Agricultural University. Ludhiana, February 18- 19.

Paul S J and Tapan S P (2006). Augmenting Rural Supply Chains with a Location- enhanced information System. Paper Presented at IEEE Xplore Conference May

Rangaswami, N (2007) ICT for development and commerce: A case study of internet cafés in India Paper presented at Proceedings of 9th International Conference on Social Implications of Computer in Developing Countries, Sao Paulo, Brazil May.

Renee K, Toyama K and Isha R (2006). Integrating Social Development and Financial Sustainability:Challenges of Rural Computer Kiosks in Kerala. Paper Presented at IEEE Xplore Conference May

Rogers E.M. (1962) Diffusion of Innovations. New York Free Press.

Rogers E.M. (1976) Communication and Development: Critical Perspectives. Beverly Hills. Sage. Sainath P (2008) Address entrenched structural inequalities, says Sainath. The Hindu, Feb 6 <http://www.thehindu.com/2008/02/06/stories/2008020659191300.htm> (Reported by Prakash Kamat.)

Sainath, P (2007) Maharashtra: 'graveyard of farmers'. OP- ED Page (Page 13). The Hindu, Nov 14. <http://www.thehindu.com/2007/11/14/stories/2007111453091100.htm>

Sudip Aryal (2007) Rural Transformation by the establishment of community information centers in the rural areas of Nepal: A Pilot Project. UNITED NATIONS ESCAP, 26 Sept.

Sujay, M (2008) Centre revamps rural electrification programme. <http://www.thehindu.com/2008/02/13/stories/2008021355021500.htm> The Hindu Feb 13.

Swaminathan Committee Report on Minimum Support Prices (2006). Government of India, New Delhi.

The World Congress on Communication for Development (2006). 25- 27 Oct, Rome Italy.

UNDP (2008) Human Development Report 2007/ 2008 http://en.wikipedia.org/wiki/List_of_countries_by_Human_Development_Index

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